MONTHLY WEATHER REVIEW,

MARCH, 1874.

WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE.

The weather of the past month has been, in almost all parts of the United States, an easy transition from winter to spring. The only instances of abnormal weather have occurred in the northernmost portion of the country. The winter temperatures and other meteorological conditions have been generally quite evenly balanced with those of early spring. These conditions are reviewed below in detail.

STORMS AND CYCLONES.

The month of March has been characterized by its usual storminess. Twelve noticeable depressions have passed over more or less of the territory of the United States. The following details sufficiently describe them: [See Storm Track Chart No. 1.]

No. I. This disturbance originated apparently in the Western Gulf States on the last night of February, and moved nearly due eastward, expanding its area of depression, and passing off the Georgia coast at midnight of March 1st. It was attended by no serious consequences.

No. II. This second storm-area of the month entered the United States on the 1st of March from the Northwest, and was marked by a very low barometer. Its track was, however, so high in latitude, that its effects were not much felt.

No. III. Was of more cyclonic force, and passed from the Southwest to northeast directly over the country. It started from Kansas on the morning of March 3rd, and reached the St. Lawrence valley on the morning of the 4th. From Montreal, its course was eastward, and it disappeared off the coast on the 5th.

No. IV. Approached from the Southwest on the evening of the 5th, and pursued a northeastward course steadily until it reached the St. Lawrence valley. It made a slight detour to the northward, crossing the Upper Lakes on the 7th, and thence advanced in a line nearly due eastward. After reaching the Lower St. Lawrence valley on the afternoon of the 8th, it paused and remained stationary, or nearly so, until the 12th—a fact most extraordinary in the progressive movements of storm-centres.

No. V. While No. IV was in progress across the country, a smaller storm-centre was formed in Virginia on the night of the 6th, and advancing up the coast in a northeasterly direction, appears to have passed beyond the Nova Scotia coast on the 8th, or else to have merged into the larger storm, (No. IV.,) which was then coming very near to its track.

No. VI. Commenced in the Southwest on the 9th, and moved over the Southern States, its track on the 11th being deflected from central Alabama to northern Florida, whence it disappeared to the eastward on that day.

No. VII. Although this storm-centre appears to have been formed in the shape of a long trough, lying north and south, west of the Mississippi valley and in the Northwest, early on the 14th, it does not appear in concentrated force until the midnight of the 15th. Then it commenced moving slowly southeastwardly from Dakota to Iowa and northern Missouri, which latter district it reached on the afternoon of the 17th. Thence, its course is at right angles to its earlier track, as it passed from Missouri to Michigan on the 18th, and, on the 19th, rapidly bore away to the Lower St. Lawrence valley, which it traversed during the night of the 19th, and next morning had disappeared. While the main storm-centre was in eastern Missouri, and making a northward or northeastward curve in its course, there was formed a severe storm or tornado in the Mississippi valley, which at 4 a. m., of the 18th, swept with great fury over Cairo, Illinois. It was accompanied by violent lightning and thunder and heavy rain, but no very remarkable oscillation of the barometer was reported. Great damage was done to property by this apparently local whirlwind. Simultaneous, but less violent, disturbances took place at Memphis, Tennessee, and the vicinities.

No. VIII. Was of little importance, originating in the Northwest on the 19th, and moving north of the Signal Service stations toward the Lower St. Lawrence valley.

No. IX. Pursued the same track on the 21st and 22d, and it, too, was of comparatively minor importance.

No. X. Began in the Northwest on the 24th, in the morning, and advanced from Dakota to Lake Superior on the morning of the 25th, and then rapidly moved south of Hudson Bay toward Labrador.

No. XI. Came up from the Lower Missouri valley on the afternoon of the 25th, and pursued its way over Illinois, Indiana and the Lower Lakes on the 26th. It passed down the St. Lawrence valley and thence from the vicinity of Montreal over New Brunswick, and was lost to view on the night of the 27th.

No. XII. A twelfth quite noticeable depression appeared in the Southwest on the 30th, and moved thence over Tennessee on the 31st producing considerable rain and snow in the Ohio valley, and in its progress eastward over Virginia, caused high winds on the Atlantic coasts. It disappeared, April 1st, in the Atlantic.

Beside these storms, several depressions have apparently advanced from the vicinity of Hudson Bay, southeastwardly, nearly to the Lower Lake region and St. Lawrence valley, but scarcely producing any marked effects in these sections, because their centres were moving eastward on higher parallels of latitude.

Meteorological data, gathered from various sources, show that these storms have been very severe after passing off the American coasts, and have apparently become more violent as they penetrated the middle and eastern side of the North Atlantic.

Without endeavoring to explain this last-named fact, it may be proper to notice that large masses of ice and icebergs were reported during March moving southward and eastward off the New Foundland coast and Banks.

ANTI-CYCLONIC AREAS.

The number of anti-cyclones, or areas of high barometer, around which the winds drew in a general direction with the hands of a watch, is six. Some of these anti-cyclonic areas have been very large, covering more than one-half of the country at the same time. The pressure of the atmosphere near their centres or crests has in some cases been as high as 30.58 and 30.73 inches. The general path pursued by these meteors has been from northwest to southeast. They have largely served to determine the temperature, wind and humidity conditions of the entire country. They have also exerted a marked and potent influence on the direction, intensity, etc., of all the cyclonic centres. Some of them remained stationary, or almost so, for several days in the Northwest.

PRECIPITATION.

The rain-fall and snow-fall are graphically shown on Chart No. 2. It will be observed there was a very large excess of rain for all the Gulf States, and a deficiency for New England, the Middle and South Atlantic States. The deficiency is quite marked in northern New England and in Florida, where the precipitation falls below a single inch for the entire month. The most marked deficiency is in the Middle States, and is one and a half inches, and nearly the same in New England and the Lower Lake region.

There is an excess of about one and a half inches for the Ohio valley and Tennessee. The snow-fall in the Rocky Mountains has been unusually heavy.

TEMPERATURE.

The thermometric data are given on accompanying Chart No. 3. This chart shows that the thermal conditions were decidedly equinoctial over the larger portion of the country, excepting, of course, the mountainous and extreme northerly States and Territories. The only remarkable deficiency of temperature was in the Upper Mississippi valley. There was a slight excess in the South Atlantic States and the Ohio valley and Tennessee. The uniformity of the isothermals and their parallelism with the lines of latitude are strikingly delineated on the chart. The only departure from this parallelism is in the Appalachian region, where the influence of altitude deflects the isothermal of 45° southward.

ATMOSPHERIC PRESSURE.

The only remarkable feature in this element of the weather is the uniformity, which is strikingly appropriate to the equinoctial month. There is no considerable deviation from 30.00 inches of pressure, except in the northeastern section of the country. There, the isobars come near together, and the pressure is very low, especially in Nova Scotia and the Lower St. Lawrence valley. The isobarometric lines are found on Chart No. 3.

WINDS.

The March winds, as a glance at Chart No. 3 will show, are characteristically from the northwest. The only observable exception to this is in the easterly and southeasterly winds of the Gulf of Mexico and the Western Gulf States, in which the trade-wind in-

fluence manifests, so early in the spring, its predominance. At Mount Washington, winds were reported on the 23d, of velocity as high as 130 miles an hour and continuing near that enormous force for twenty-four hours.

RIVERS.

The condition of the rivers will be found in one of the tables on Chart No. 2. The Red river, it will be seen, rose at Shreveport to its highest as the month closed. So also the Missouri at Leavenworth. The Cumberland was very high on the 25th, but afterward fell considerably. The Ohio was in flood, the first of the month, at Cincinnati and Louisville, but it fell at the close. During the whole month the Mississippi river rose slowly but steadily at Vicksburg to forty-three feet above low water mark. Also, about the 11th, it rose at Cairo forty-five feet above low water mark, but, as the month progressed, it fell at the latter point. The month closed without any indications of very alarming floods in the Western rivers.

PECULIAR PHENOMENA AND FACTS.

From Nashville the observer reports, what may be of interest to agriculturists, that an inspection of the country around Nashville by a member of the Board of Trade of that city shows "that the grass-hoppers and other insects which are usually killed by the cold of winter are this spring alive and already moving." Repeated investigation has confirmed this statement.

At Knoxville, March 7, 7 p. m., there was an extraordinarily brilliant aurora, the first of this year, "in two bands: one triangular, base in the horizon, or near it, with opposite vertex, which was ill-defined, about 15° NW from zenith; the other was nearer in the north and far brighter, but not so extensive." The "dark segment," the "waving flag aurora," and the "merry dancers" were plainly seen for some time. The same phenomenon was seen at other points in the West where the night was cloudless. It was also reported, same night, from Albany, N. Y., where "a continuous sheet of brilliant white light encircled the horizon, extending to an altitude of 35° in the Northeast and to an altitude of 12° in the Southwest, the light in the Northeast strongly contrasted with a dark segment of slate-color beneath it and about fifty-two streamers of straw-color." On the same night and hour it was observed at Norfolk, Va., where the color was of a "pale yellow," partly obscured by clouds; and, from this point, it was visible far westward. The Observer at Pike's Peak reports that, for the first time since the occupation of the summit, he saw an auroral arch on the same evening. It was seen simultaneously at Louisville, Kentucky; at Breckenridge, Minnesota; at Eastport, Maine; faintly at Indianapolis, Indiana; apparently at Augusta, Georgia; faintly at Yankton, Dakota; Davenport, Iowa, and other points.

During the conflagration at Indianapolis on the 22d, the wind was observed not to take any cyclonic direction, but to blow in a straight line. At Mobile, on the 22d, the thermometer reached 82° F. At Augusta, Georgia, on the 16th and 17th, there were forty consecutive hours of rainfall, amounting to 5.10 inches. At Salt Lake City, on the 17th, light snow fell from a cloudless sky, while the stars were visible over the whole sky. At Marquette, on Lake Superior, where observations are taken to compare the movements of water in the Lake, and the rise and fall of the barometer, the result shows the water and barometer acted together forty times and in a contrary manner fifty-three times.

At Omaha, Nebraska, on the 6th, wild geese were seen moving south. The Santa Fé Observer states, in his March report: "One year ago the trees and vines had leaved out, but were killed by the frosts that came in the latter part of the month. Thus far, this year, there have been no signs of premature buds, leaves and blossoms; from which fact all classes predict an unusually good year for fruit and all the productions of the soil. But, particularly, are they looking forward to a good "grape crop." In the mountains there is so much snow that water is abundant everywhere; in fact all classes of people are rejoicing."

BREAKING UP OF ICE AND OPENING OF NAVIGATION.

On the 19th of March the ice all disappeared from the river at Rochester, New York, and navigation to that port was resumed on the 25d. At La Crosse, Wisconsin, the Mississippi opened on the 28th, or nine days later than last year, having been closed four months, and one day. The navigation at Alpena, Michigan, re-opened on the 20th; at Detroit on the 18th. At Yankton, Dakota Territory, the ice in the Missouri broke up on the 20th; the ice in the harbor at Buffalo gave way on the same day, but not sufficiently to render navigation easy or safe.

CAUTIONARY SIGNALS.

During the month of March, including the night of the 31st, there were ordered for ports of the United States, in all, fourteen (14) Cautionary Signals. Of this number, one was late. The correctness of one is doubtful. The number reported as actually justified was twelve [12.] This gives as the percentage of correct signaling, 85. Owing to the suspension of navigation on the Lakes, no signals were displayed there during March.

Besides the display of Cautionary Signals at United States ports, there were telegraphed to Canadian ports twenty-nine warnings of approaching storms. Although the exact percentage of justification cannot be determined from data in this Office, it is known that most of these warnings were followed by dangerous gales.

It may serve to illustrate the practical utility of the Cautionary Signals to quote the words of the Observer regarding the warning signal hoisted on the 31st at Norfolk, Va. He says: "The signal was fully justified, as a heavy gale prevailed outside. A very large fleet (200) of sailing vessels put into Hampton Roads, and remained there twelve hours after the signal was lowered.

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

Albert J. Myer

Brig. Gen. (Bvt. Assg^{t},) Chief Signal Officer, U. S. A.

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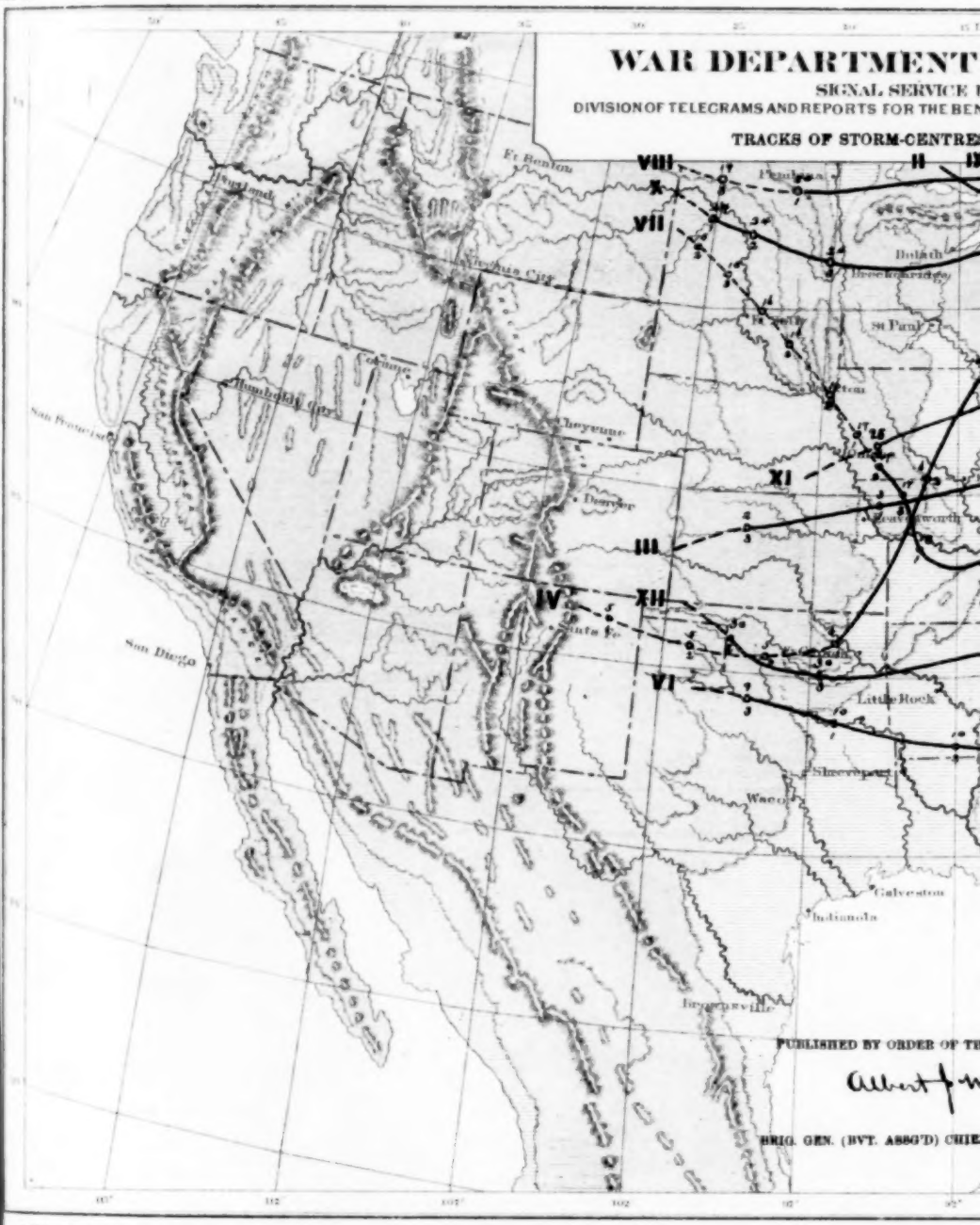

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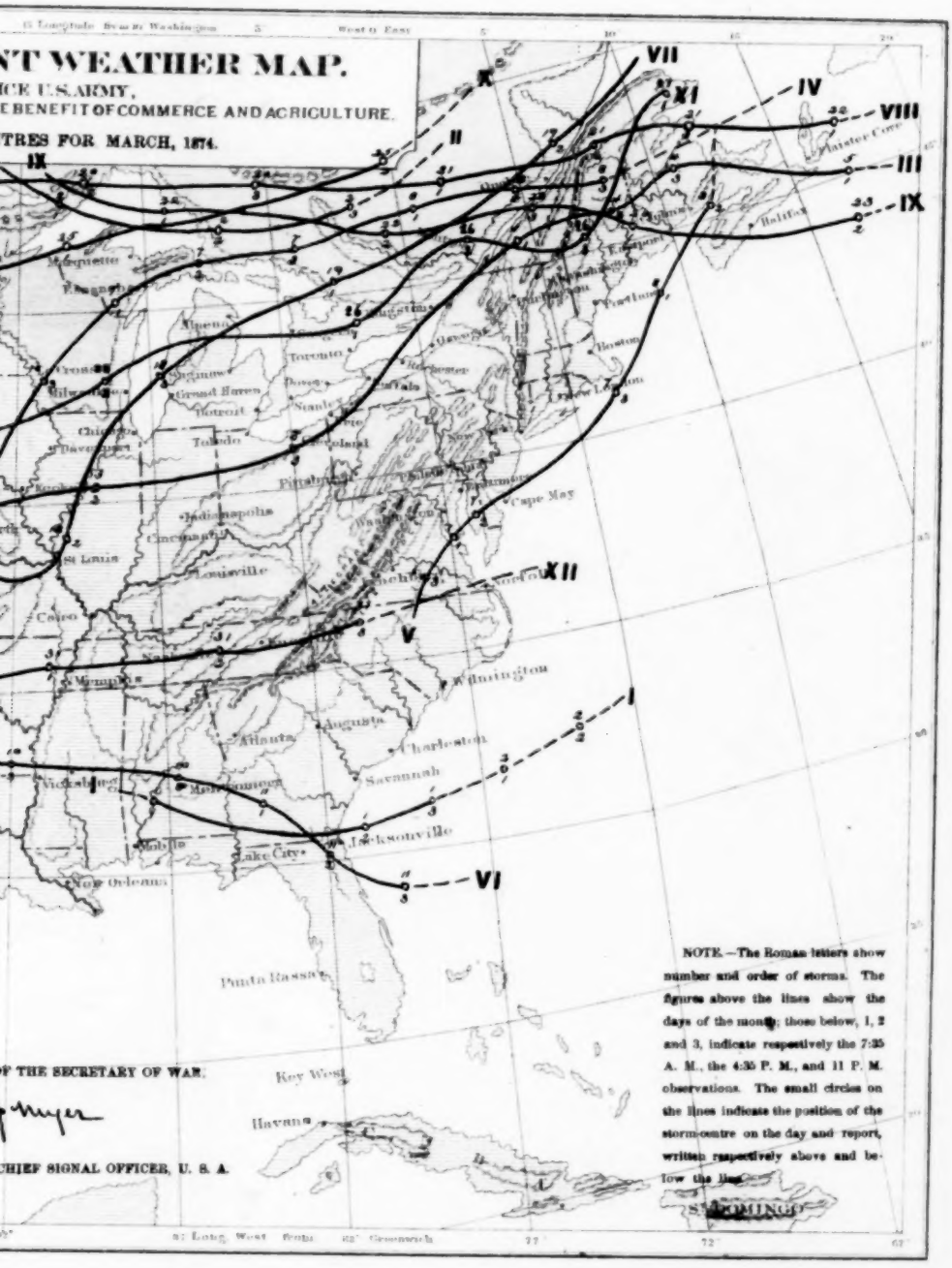
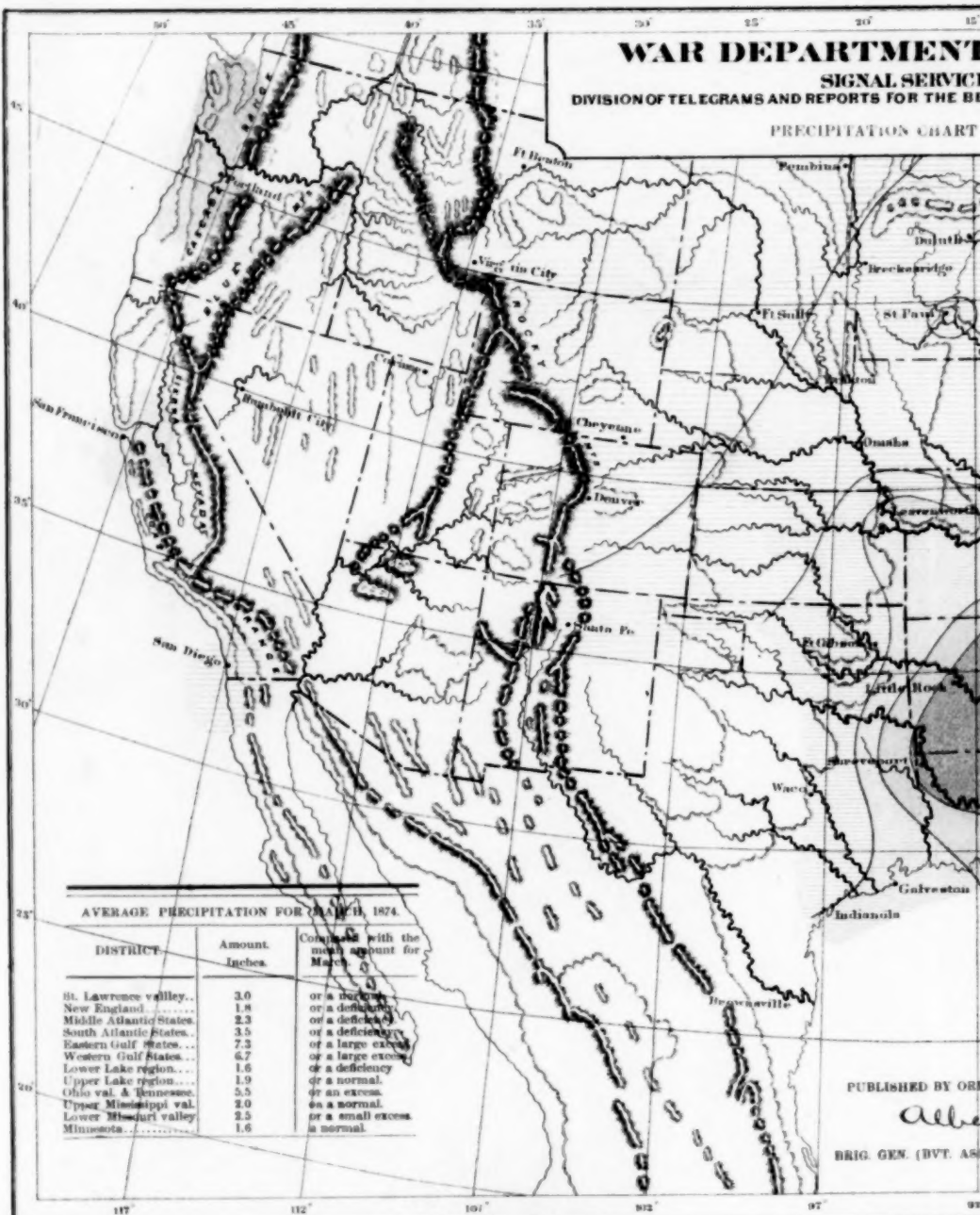

NT WEATHER MAP.
ICE U.S.ARMY,
E BENEFIT OF COMMERCE AND AGRICULTURE.
TRES FOR MARCH, 1874.
VII
IV
VIII
III
IX
XII
V
I
VI
NOTE.—The Roman letters show number and order of storms. The figures above the lines show the days of the month; those below, 1, 2 and 3, indicate respectively the 7:35 A. M., the 4:35 P. M., and 11 P. M. observations. The small circles on the lines indicate the position of the storm-centre on the day and report, written respectively above and below the line.
OF THE SECRETARY OF WAR.
CHIEF SIGNAL OFFICER, U. S. A.


WAR DEPARTMENT
SIGNAL SERVICE
DIVISION OF TELEGRAMS AND REPORTS FOR THE BE
PRECIPITATION CHART
Ft Benton
Pembina
Virginia City
Duluth
Breckenridge
Ft Sully
St Paul
Cheyenne
Omaha
Denver
Santa Fe
San Francisco
San Diego
Little Rock
Galveston
Indianola
Brownsville
PUBLISHED BY OR
BRIG. GEN. (BVT. AS
AVERAGE PRECIPITATION FOR MARCH, 1874.
DISTRICT
Amount. Inches.
Compared with the mean amount for March.
St. Lawrence valley.. 3.0 or a normal.
New England..... 1.8 or a deficiency.
Middle Atlantic States. 2.3 or a deficiency.
South Atlantic States.. 3.5 or a deficiency.
Eastern Gulf states... 7.3 or a large excess.
Western Gulf States... 6.7 or a large excess.
Lower Lake region.... 1.6 or a deficiency
Upper Lake region.... 1.9 or a normal.
Ohio val. & Tennessee. 5.5 or an excess.
Upper Mississippi val. 2.0 on a normal.
Lower Missouri valley 2.5 or a small excess.
Minnesota..... 1.6 a normal.

NT WEATHER MAP.

VICE, U.S. ARMY.

HE BENEFIT OF COMMERCE AND AGRICULTURE.

ART FOR MARCH, 1874.

HEIGHT OF RIVERS ABOVE LOW WATER MARK.

STATION.	HIGHEST.			LOWEST.		
	Date Mar.	Height. ft.	In.	Date. Mar.	Height. ft.	In.
RED RIVER.						
Shreveport	31	37	7.	1	22	10
MISSOURI.						
Yankton						
Omaha						
Leavenworth	25	5	2	17	0	1
MISSISSIPPI.						
St. Paul						
La Crosse						
Dubuque	20	7	4	2	4	3
Davenport	9	15	7	31	5	3
Keokuk	12	9	6	2	2	2
St. Louis	11	17	7	2	10	6
Cairo	11	45	5	22	36	3
Memphis	13	34	2	1	31	10
Vicksburg	31	43	0	2	37	7
New Orleans *	31	1	1	1	4	6
CUMBERLAND.						
Nashville	25	38	0	18	8	8
OHIO.						
Pittsburgh	7	12	8	18	5	0
Cincinnati	1	37	1	31	17	8
Louisville	1	18	6	18	-8	2

*Below high water mark.

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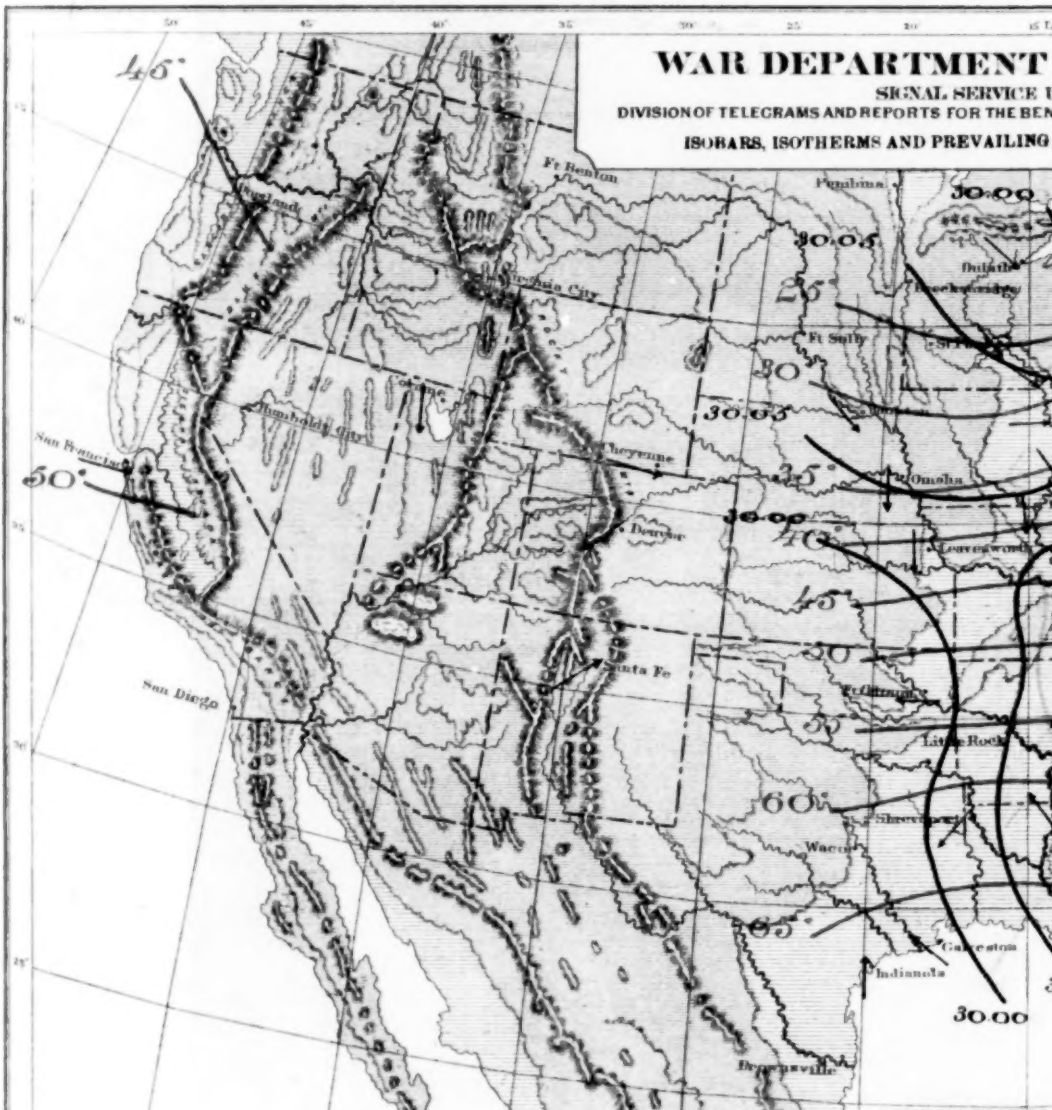
T. ASSG'D) CHIEF SIGNAL OFFICER, U. S. A

H. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.



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NT WEATHER MAP.

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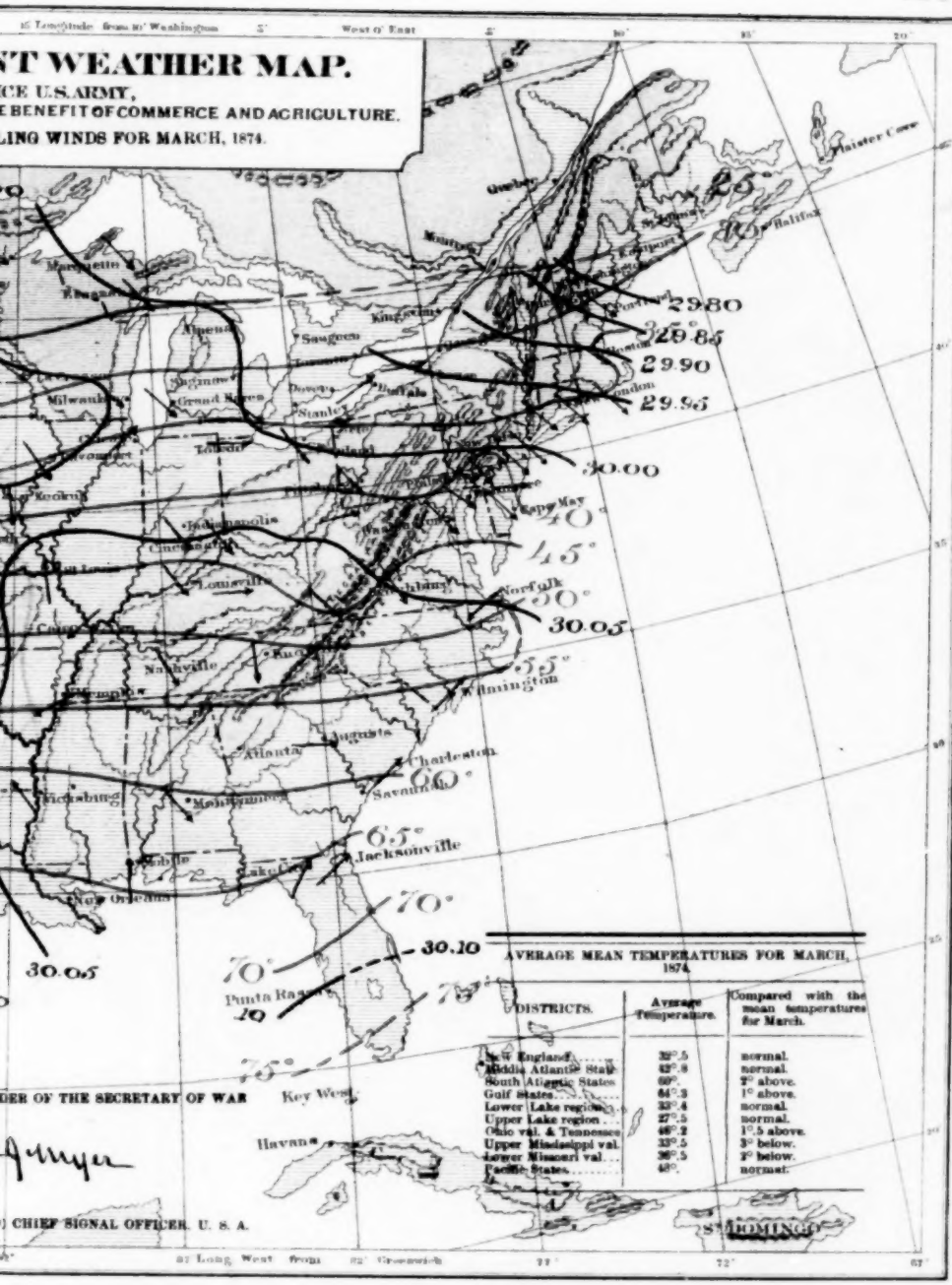
E BENEFIT OF COMMERCE AND AGRICULTURE.
LING WINDS FOR MARCH, 1874.



AVERAGE MEAN TEMPERATURES FOR MARCH, 1874.

DISTRICTS.	Average Temperature.	Compared with the mean temperatures for March.
New England	32°.5	normal.
Middle Atlantic States	42°.8	normal.
South Atlantic States	60°.	2° above.
Gulf states	64°.3	1° above.
Lower Lake region	33°.4	normal.
Upper Lake region	27°.5	normal.
Ohio val. & Tennessee	46°.2	1°.5 above.
Upper Mississippi val.	33°.5	3° below.
Lower Missouri val.	36°.5	2° below.
Pacific States	48°.	normal.

DER OF THE SECRETARY OF WAR

CHIEF SIGNAL OFFICER, U. S. A.